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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,379	08/14/2006	Daniel J. Arriola	63558C	7039

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The Dow Chemical Company
Intellectual Property Section
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EXAMINER	
CHOI, LING SIU	

ART UNIT	PAPER NUMBER
1796	

MAIL DATE	DELIVERY MODE
02/18/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/589,379	ARRIOLA ET AL.	
	Examiner	Art Unit	
	Ling-Siu Choi	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 November 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) *3-22 and 30-34* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,23 and 24* is/are rejected.

7)☒ Claim(s) *25-29* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 August 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/18/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to the Response to Election/Restriction filed 11/09/2009. Claims 1-2 and 23-29 of Group I have been elected without traverse.

Claim Analysis

2. Summary of Claim 1:

A copolymer formed by polymerizing propylene, 4-methyl-1-pentene, styrene, or another C_{4-20} α-olefin, and a copolymerizable comonomer in the presence of a composition comprising the admixture or reaction product resulting from combining:	
A	a first olefin polymerization catalyst,
B	a second olefin polymerization catalyst capable of preparing polymers differing in chemical or physical properties from the polymer prepared by catalyst (A) under equivalent polymerization conditions, and
C	a chain shuttling agent.

Summary of Claim 2:

A copolymer formed by polymerizing propylene, 4-methyl-1-pentene, styrene, or another C_{4-20} α-olefin, and a copolymerizable comonomer in the presence of a composition comprising the admixture or reaction product resulting from combining:	
A	a first olefin polymerization catalyst having a high comonomer incorporation index,
B	a second olefin polymerization catalyst having a comonomer incorporation index less than 95 percent of the comonomer incorporation index of catalyst (A), and

C	a chain shuttling agent.

Claim Rejections - 35 USC § 102

3. **The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:**

> **A person shall be entitled to a patent unless –**
>
> **(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.**
>
> **(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.**

4. Claims 1-2 and 23-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Mink et al. (US 2004/0242808 A1).

"A copolymer formed by polymerizing propylene, 4-methyl-1-pentene, styrene, or another C_{4-20} α-olefin, **and** a copolymerizable comonomer….." is interpreted to be a copolymer of ethylene copolymer when the copolymerizable comonomer can be ethylene and the amount of ethylene in the copolymer is not cited in the claims.

Mink et al. disclose a polyolefin obtained by a process comprising (a) combining a catalyst precursor and a cocatalyst, the catalyst precursor comprising a bimetallic catalyst precursor comprising **a non-metallocene compound of a transition metal**

and **a metallocene compound**, and the cocatalyst comprising an **organoaluminum** component and a modified methylaluminoxane component, to obtain an activated catalyst; (b) contacting the activated catalyst with olefin monomers under polymerization conditions to form polyolefin; (c) determining at least one product parameter of the polyolefin [melt flow rate; molecular weight polymer]; and (d) varying the ratio of organoaluminum component to modified methylaluminoxane component based on comparing the product parameter to a target product parameter [target melt flow rate; target molecular weight polymer], wherein the trialkylaluminum compound comprises at least one of trimethylaluminum, **triethylaluminum**, tripropylaluminum, tributylaluminum, triisobutylaluminum, trihexylaluminum and trioctylaluminum (claims 1-13). Mink et al. further disclose that "[t]he choice of monomers used in a polymerization according to the present invention can be made by one skilled in the art based on the type of polyolefin to be produced. Polyethylenes, for example, may be produced by polymerizing ethylene, optionally in the presence of one or more higher olefins, such as one or more alpha-olefins. Suitable alpha-olefins include, for example, C_{3-10} alpha-olefins, such as **propylene**, 1-butene, 1-hexene, **4-methyl-1-pentene**, and 1-octene. Mixtures of alpha-olefins may also be used" ([0086]). It is noted that the comonomer incorporation index depends on the type of catalyst. Since the non-metallocene compound of a transition metal is quite different from the metallocene compound, "a second olefin polymerization catalyst having a comonomer incorporation index less than 95 percent of the comonomer incorporation index of catalyst (A) [a first olefin

polymerization catalyst]" would be met. Thus, the present claims are anticipated by the disclosure of Mink et al.

5. Claims 1 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Chien et al. [Macromolecules, **30**, 3447-3458 (1997)].

Chien et al. disclose a polypropylene obtained by homopolymerizing propylene in the presence of a combination of two metallocene catalysts having different stereospeclfictties: rac-ethylenebis (1-η^5-indenyl)zirconium dichloride or rac-dimethylsilylenebis(1-η^5-indenyl)zirconium dichloride as iso-specific catalyst precursors and ethylenebis (9-η^5-fluorenyl)zirconium dichloride as an a-specific precursor, which is activated with trtphenylcarbenium tetrakis(pentafluorophenyl) borate and triisobutylaluminum, wherein the products ranging from tough plastomers to weak elastomers can be obtained by varying the ratio of the two types of precursors (abstract). Thus, the present claims are anticipated by the disclosure of Chien et al.

6. Claims 1 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Lieber et al. [Macromolecules, **33**, 9192-9199 (2000)].

Lieber et al. disclose a polypropylene obtained by polymerizing propylene in the presence of a combination of $Me_2Si(2\text{-}MeInd)_2$ $ZrCl_2$ and $en(Flu)_2ZrCl_2$, which are activated by either MAO or Al $^tBu_3$ and trityl borate, wherein the propylene polymerization with different ansa-zirconocenes leads to the growing polypropyl chains being transferred to alkylaluminum cocatalyst, resulting in the formation of stereoblock

polymer (abstract; 2nd paragraph, page 9194). Thus, the present claims are anticipated by the disclosure of Lieber et al.

7. Claims 1 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Przybyla et al. [Acta polym. 50, 77-83(1999)].

Przybyla et al. disclose a polypropylene obtained in the presence of a catalyst comprising two metallocenes [rac-$Me_2Si[Ind]_2ZrCl_2$] (iso-specific catalyst) and i-Pr[$FluC_p$]$ZrCl_2$ (syndio-specific catalyst) simultaneously supporting on silica/MAO, wherein the use of aluminumalkyl as a chain transfer agent leads to formation of stereoblock polypropylene (abstract). Thus, the present claims are anticipated by the disclosure of Przybyla et al.

Allowable Subject Matter

8. Claims 25-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims: the prior art references do not teach or fairly suggest the use of the specific catalyst.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling-Siu Choi whose telephone number is 571-272-1098. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/Ling-Siu Choi/

Primary Examiner, Art Unit 1796

February 09, 2010